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UNDESCRIBED SPECIES OF NEARCTIC TIPULIDAE (DIPTERA), X

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At this time I am describing various new species of crane flies from western North America, including Alaska and British Columbia, collected by Dr. Marion E. Smith and David L. Carson; Nevada by Dr. Donald G. Denning; and Utah, by Dr. George W. Knowlton, Dr. C. Dennis Hynes, and Dr. Donald W. Davis. I am greatly indebted to the persons listed for permission to retain the types of the novelties in my personal collection of World Tipulidae.

Genus *Tipula* Linnaeus

Subgenus *Arctotipula* Alexander

Tipula (*Arctotipula*) Alexander; Philippine Jour. Sci., 52:410; 1933.

Several species of *Arctotipula* now are known from Alaska and adjoining territories and a brief discussion of certain of the previously described forms seems to be advisable. The references cited are listed at the conclusion of the paper.

Lackschewitz (1936:290) has placed *Tipula* (*Arctotipula*) *aleutica* Alexander (1923) in the synonymy of *T. (A.) besselsi* Osten Sacken, certainly in error. The outer wing veins of *aleutica* have abundant macrotrichia while the hypopygial structure is quite distinct from that of *besselsi* and certain other allied species. In the same paper, Lackschewitz (1936:288) places *T. (A.) alascaensis* Alexander (1923), described from the Pribilof islands, in the synonymy of *ciliata* Lundström (1915), a course that was followed by Savchenko (1961:325). It may be affirmed that the two flies are quite distinct in hypopygial characters, very definitely in the structure of the inner dististyle. In *alascaensis* the beak of the latter is short and obtusely rounded to appear almost suboval in outline, extending only a short distance beyond the very stout outer spine of the style. *T. (A.) øklandi* Alexander (1921), described from Nova Zembla, likewise was considered by both Lackschewitz and Savchenko as being identical with *ciliata* but paratype specimens in my

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collection have the conformation of the inner dististyle different from that shown by Savchenko (1961:326, fig. 3) for *ciliata*, including the beak and the outer spine.

Tipula (Arctotipula) denali, n.sp.

Size medium (wing of male 14.5 mm.); flagellar verticils short; general coloration of body dark gray, vestiture very reduced to nearly absent; wings yellowish white, restrictedly patterned with brown; *Rs* long, about two and one-half times *m-cu*; male hypopygium with posterior border of tergite triemarginate, the intermediate lobes acute, their mesal borders microscopically toothed; outer dististyle small, vestiture short.

MALE.— Length about 16 mm.; wing 14.5 mm.; antenna about 4 mm.

Frontal prolongation of head about three-fourths the remainder, light gray above, more plumbeous on sides, nasus stout; vestiture reduced to very sparse short stout black setae on outer half of prolongation; palpi black. Antennae black; flagellar segments without basal enlargements, longer than the verticils, beyond the first with dense short yellow setulae. Head uniformly gray with a vague more darkened line on posterior vertex; vertical tubercle low, depressed medially; posterior half of head with sparse short black setae, longer and porrect on genae and beneath, very reduced in number and size on vertex, lacking on the midportion.

Cervical region and pronotum blackened, heavily gray pruinose. Mesonotal praescutum light gray with four scarcely indicated darker gray stripes that are very narrowly bordered by darker; scutum gray, each lobe with two confluent darker areas, the anterior one smaller; posterior sclerites of notum light gray, parascutella pale; notum virtually glabrous, praescutal interspaces with microscopic punctures that bear tiny yellow setulae. Pleura light gray, vaguely patterned with darker gray areas; dorsopleural region buffy yellow. Halteres brown. Legs with coxae light gray, vestiture reduced to sparse microscopic yellow setulae; trochanters dark gray; femora and tibiae reddish brown, tips darker; tarsi dark brown; claws of male with a single slender tooth. Wings yellowish white, with an extensive pale brown clouded pattern that is subequal in extent to the ground, stigma darker brown, oval; more extensive brown clouds include a continuous seam along *Rs*, two large areas in cell *M*, most cells beyond cord, and outer ends of cubital and anal cells; the major ground areas include the prearcular and costal fields, cell *R* and interspaces of cells *M* and *Cu*, and the broad central part of cell *1st A*; outer radial field chiefly of the ground, including cell *Sc*₂, most of *R*₂, and a subbasal brightening in cell *R*₃; veins brown, obliterative sections very extensive, especially in the veins that enclose cell *1st M*₂. Veins posterior to *R* glabrous. Venation: *Rs* very long, about two and one-half times *m-cu*; petiole of cell *M*₁ shorter than *m*.

Abdomen dark plumbeous gray, basal tergite paler gray; posterior borders of both tergites and sternites very narrowly obscure yel-

low. Male hypopygium with tergite relatively narrow, transverse, posterior border with three U-shaped emarginations to produce two narrow acute intermediate lobes and broader lateral ones, the mesal borders of the intermediate pair microscopically toothed, of the lateral pair with a pale plate; vestiture of tergite relatively abundant but very short and inconspicuous. Ninth sternite with lobes elongate-oval, with long yellow setae. Basistyle oval, entire. Outer dististyle small, long-oval, with weak delicate setae; inner style with beak flattened, pale, tip obtuse; lower beak blackened, obtuse, posterior crest conspicuous, with darkened parallel lines at base; region of outer basal lobe a small plate that narrows into an acute black spine. Aedeagus long and very stout. Eighth sternite transverse, posterior border convexly rounded, medially with a triangular membranous area; setae very small and sparse, with a group of longer and more conspicuous yellow setae adjoining the membranous area.

HABITAT.—Alaska.

HOLOTYPE, Muldrow Glacier, McKinley National Park, July 19, 1952 (D. L. Carson).

The specific name '*denali*' is that of the native name for Mount McKinley, Denali, 'Home of the Sun'. I am referring this fly to the subgenus *Arctotipula* despite the differences in hypopygial structure from the subgenotype and allied species. The virtually glabrous body similarly is discordant in this subgenus. The wing pattern is approached by that of *Tipula* (*Arctotipula*) *twogwoteana* Alexander of the higher Rocky Mountains of Colorado and Wyoming which has the hypopygial structure quite different, being more suggestive of species in the subgenus *Sinotipula* Alexander.

Tipula (*Arctotipula*) *epios*, n.sp.

Allied to *thulensis*, differing chiefly in hypopygial characters, especially the acutely pointed lobes of the ninth tergite and the broad outer dististyle.

MALE.—Length about 14 mm.; wing 15 mm.; antenna about 4 mm.

Frontal prolongation of head relatively short, about one-half the remainder, light gray; dorsal surface with long black setae, nasus long and stout; palpi black. Antenna black throughout; flagellar segment subequal to their longest verticils, basal enlargements poorly to scarcely developed. Head gray, front and orbits light gray; vertex with abundant long erect black setae, lacking on midarea; eyes relatively small, anterior vertex correspondingly broad.

Pronotal scutum gray, with long erect setae, scutellum brownish gray, the angles more reddened. Mesonotal praescutum light gray with four darker gray stripes, the intermediate pair narrowly separated by a central ground stripe without setae, remainder of ground areas with abundant long erect setae; scutum light gray, each lobe with two separate darker gray areas, vestiture short and very sparse; scutellum dark gray with very long setae, parascutella glabrous; postnotum uniformly gray, mediotergite with very long setae, pleuro-

tergite glabrous. Pleura gray, doropleural region buffy yellow; sternopleurite and metapleura with long setae, lacking on meron. Halteres with stem brownish yellow, knob clearer yellow, base weakly darkened. Legs with coxae gray, setae very long; trochanters blackened, gray pruinose; femora brownish yellow, tips blackened; tibiae yellowish brown, darker outwardly; tarsi black; claw of male with a small triangular tooth at near midlength. Wings subhyaline to weakly tinted, cell *Sc* more yellowed; stigma oval, brown; veins light brown. Veins posterior to *R* chiefly glabrous, with trichia on *R*₂₊₃, distal section of *R*₄₊₅ and restrictedly near outer end of 2nd *A*. Venation: Petiole of cell *M*₁ shorter than *m*; *M*₃₊₄ short, about one-half the basal section of *M*₁₊₂ or less.

Abdomen dark plumbeous gray, extreme borders of the segments yellowed; hypopygium blackened. Male hypopygium with tergal lobes acute, tips pointed; median emargination broadly U-shaped, its diameter subequal to that of the lateral lobe. Outer dististyle very broad, the greatest width about three-fourths the length; inner style with lateral spine blackened, slender, gently curved.

HABITAT.— British Columbia.

HOLOTYPE. ♂. Alaska Highway, Mile 316, along 107 Creek, June 26, 1952 (M. E. Smith).

Among the numerous members of the subgenus the present fly is closest to *Tipula* (*Arctotipula*) *thulensis* Alexander, still known only from Baffin Island, Canadian Northwest Territories. It differs especially in details of hypopygial structure, as described. None of the northern Palaearctic members of the subgenus has the tergal lobes acute as in the present fly.

Tipula (*Arctotipula*) *mckinleyana*, n.sp.

General coloration of head and thorax gray, praescutum with four poorly differentiated darker gray stripes; antenna of male relatively short; wings faintly darkened, the long-oval stigma solidly darkened; male hypopygium with beak of inner dististyle relatively slender, on side before apex with a low blackened flange, margin at base of beak with a powerful broad-based lobe that narrows into a strong black spine, margin of style with one or two more basal spinous points.

MALE.— Length about 14 mm.; wing 15.5 mm.; antenna about 3.3 mm.

Frontal prolongation of head gray above, more brownish black beneath; nasus long and stout, with long black setae; palpi brownish black. Antennae relatively short; scape dark brown, sparsely pruinose, pedicel brown; flagellum black, segments without basal enlargements, slightly exceeding their longest verticils. Head with front and the broad orbits clear light gray, posterior vertex darker gray, with numerous relatively short black setae, midregion glabrous, light brown; ventral surface of head with very long pale setae.

Pronotal scutum dark gray, scutellum yellowed. Mesonotal praescutum light gray with four poorly differentiated darker gray stripes;

vestiture of interspaces long, erect; scutum almost uniformly dark gray, vestiture restricted to sparse long setae on the posterior callosities; scutellum brownish gray, with long setae, parascutella paler gray; mediotergite gray, with sparse long setae, pleurotergite gray. Pleura gray, glabrous; dorsopleural membrane buffy yellow. Halteres with stem pale brown, yellowed at base, knob darker, apex obscure yellow. Legs with coxae gray, with long pale setae; trochanters dark gray; femora yellow, tips conspicuously blackened; tibiae obscure yellow, darker outwardly; tarsi dark, claws of male toothed. Wings faintly darkened, stigma long-oval, dark brown; veins brown, those in costal and prearcular fields light brown. Veins posterior to *R* essentially glabrous, with three or four trichia on distal section of R_{4+5} and still more sparsely on 2nd *A*. Venation: *Rs* about two and one-half times *m-cu*; cell 1st M_2 long, nearly parallel-sided.

Abdomen dark brownish gray, posterior borders of tergites obscure yellow, of the sternites more narrowly so; hypopygium brownish black, tergal lobes and styli paler. Male hypopygium with tergite longer than broad, posterior third with two broad lobes that are separated by a very narrow emargination, inner edges of lobes and outer half of tergite with abundant black setae. Outer dististyle broadest at near midlength, the greatest width at near two-thirds the length; inner style with beak relatively slender, with a small blackened lateral flange beyond midlength; posterior margin of style with one or two basal spines and an outer very powerful broad-based lobe that bears the sensory area at its base, thence narrowed into a strong blackened spine that is directed outwardly. Eighth sternite transverse, posterior border nearly truncate, narrowly membranous, outer half of plate with numerous moderately long setae.

HABITAT.—Alaska.

HOLOTYPE. Sable Pass, McKinley National Park, July 20, 1952 (M. E. Smith).

Tipula (*Arctotipula*) *mckinleyana* differs from other generally similar species chiefly in details of structure of the male hypopygium, particularly the tergite and inner dististyle. The most similar species is *T. (A) smithiae* Alexander which differs in the wing coloration and in the hypopygium, especially the quite different inner dististyle.

Tipula (*Platytipula*) *knowltoniana*, n.sp.

Size small (wing about 10.5 mm.); mesonotal praescutum brownish gray with four darker brown stripes, pleura light gray; wings tinged with brown, costal border darker brown; abdominal segments with a darkened longitudinal central line; male hypopygium with tergal lobes appearing as broad circular blades that are bordered by black, at base of each on lower surface with a slender blackened rod; inner style with beak stout, disk with a conspicuous blackened bilobed structure.

MALE.—Length about 13 mm.; wing 10.5 mm.

FEMALE.—Length about 14 mm.; wing 10.5 mm.

Frontal prolongation of head light gray above, brownish yellow laterally; palpi brownish black. Antennae with scape and pedicel brownish yellow; flagellum broken. Head gray, orbits and sides of vertical tubercle more yellowed; a vague central darkening from summit of tubercle caudad almost to occiput.

Cervical region yellow. Pronotal scutum restrictedly yellowed, with three extensive gray areas, scutellum yellowed medially, sides gray. Mesonotal praescutum brownish gray with four darker brown stripes, the intermediate pair confluent at anterior ends, divided at near midlength, not reaching the suture behind; posterior sclerites of notum gray, each scutal lobe with a darkened spot laterally behind the suture, parascutella more yellowed. Pleura light gray, dorso-pleural membrane yellow. Halteres with stem light brown, knob dark brown. Legs with coxae light gray; trochanters yellowed; femora brown, more yellowed basally, tibiae brown, tarsi passing into brownish black; claws of male small, simple; vestiture of legs of female long and erect, much as in *perhirtipes*. Wings tinged with brown, cells *C* and *Sc* conspicuously darker brown; stigmal region chiefly obscure yellow, with a more darkened cloud at either end, proximally including *Sc*₂, distally involving *R*₁ and free tip of *Sc*₂; veins brown. Sparse macrotrichia on veins *R*₃, *R*₄₊₅, *M*₁ and *M*₂ in male, in female more sparse and restricted to outer ends of veins *R*₃ to *M*₁. Venation: *R*_s and *R*₂₊₃ subequal; petiole of cell *M*₁ from about one-third to one-half the length of the cell.

Abdominal tergites yellowish brown, sternites paler, both with a narrow central dark brown longitudinal stripe that becomes obsolete at about the seventh segment. Male hypopygium with tergal lobes appearing as broad circular pale brown blades with narrowly blackened margins, the intervening emargination subrectangular; each lobe at base of lower margin with a slender blackened rod. Outer dististyle relatively small, about three times as long as broad, tip obtuse; inner style with beak stout, on disk of style with a conspicuous blackened structure, its outer part unequally bilobed.

HABITAT.— Utah.

HOLOTYPE. ♂, Farmington, Davis Co., September 23, 1967 (G. F. Knowlton). ALLOTOPOTYPE, ♀, pinned with type.

I take great pleasure in naming this fly for my longtime friend and colleague, Dr. George F. Knowlton, to whom much of our present knowledge of the crane flies of Utah is due.

The fly is generally similar to the economically important Smoky Crane fly, *Tipula (Platytipula) cunctans* Say, differing evidently in hypopygial structure. A few further American members of the subgenus bear a resemblance to these, the one most similar to the present fly being *T. (P.) perhirtipes* Alexander which still is known only from the female type taken in Kennebec County, Maine, differing in its larger size and in slight details of coloration, wing venation and trichiation of the wing veins. It is believed that the discovery of the male sex of the eastern species will provide further characters for the separation of the two flies.

Tipula (Sinotipula) denningi, n.sp.

Belongs to the *commiscibilis* group, allied to *josephus*, differing evidently in hypopygial structure, especially the tergite and dististyles.

MALE.— Length about 20-21 mm.; wing 19-20 mm.; antenna about 3.0-3.5 mm.

FEMALE.— Length about 18 mm.; wing 22 mm.

Frontal prolongation of head dark brown, base yellowed; nasus long and slender; palpi brown. Antennae with scape and pedicel yellow, flagellum black; flagellar segments shorter than their verticils. Head light grayish brown, orbits and lateral parts of anterior vertex slightly more yellowed; vertex with a narrow dark brown median vitta.

Pronotal scutum light gray, with three brown areas; scutellum and pretergites light yellow. Mesonotal praescutum brownish yellow with four gray stripes that are narrowly margined with black, lateral borders broadly blackened; each scutal lobe with two darkened areas, the major inner one oval, gray, bordered with darker, central area obscure yellow; scutellum light brown with a narrow central darkened line, parascutella pearly yellow; mediotergite gray with a darkened central area, pleurotergite obscure yellow, patterned with brown. Pleura obscure yellow, mesepisternum variegated with gray; dorsopleural membrane light yellow. Halteres with stem yellow, base of knob brown, apex broadly light yellow. Legs with coxae yellow, patterned with brown; trochanters yellow; femora and tibiae obscure yellow, tips blackened; tarsi light brown; claws of male small, simple, nearly straight. Wings brownish gray, very inconspicuously patterned with pale brown and yellow; costal field yellowed; stigma oval, brown; disk with pale brown and yellow markings, the latter near outer end of cell *M* adjoining vein *cu*, and in cell *Cu* at either end of a darkened area at near one-third the length of cell; beyond cord, with conspicuous pale yellow seams along veins and marginally at centers of cells; veins brown. Costal fringe short and dense; trichia of veins *Sc* and *R* abundant, *R*₄₊₅ with numerous trichia on more than outer half. Venation: *Rs* about one-third longer than *R*₂₊₃.

Abdominal tergites obscure orange yellow with a broad brown central stripe and narrow darker brown sublateral lines, extensively interrupted at bases and apices of segments, lateral borders narrowly yellow; sternites yellowish brown, posterior margins of intermediate segments yellow, narrower on outer sternites. Male hypopygium with lateral tergal arms unequally bilobed, with dense black setae, median area pale. Dististyles very unequal, outer style very large, conspicuously bilobed, provided with long black setae, upper arm narrower, terminating in a microscopic black point, near base with two blackened lobes, one glabrous, the other with abundant black setae; inner style much smaller, body with long black setae, rostrum long and slender. Phallosome a strong blackened horn, with a smaller

basal point. Eighth sternite with posterior border truncate, unmodified.

HABITAT.— Nevada.

HOLOTYPE, ♂, South Fork of Humboldt River, Elko County, August 27, 1967 (D. G. Denning). ALLOTYPE, ♀, with type. PARATYPES, 2 ♂♂.

This interesting crane fly is dedicated to the collector, Dr. Donald G. Denning, outstanding student of the North American Trichoptera. The nearest relative is *Tipula (Sinotipula) josephus* Alexander, of eastern Oregon, readily distinguished by the structure of the hypopygium, particularly the tergite and dististyles. *T. (S.) commiscibilis* Doane is more distantly allied.

Tipula (Eremotipula) eurystyla, n.sp.

Size medium (wing of male 14 mm.); general coloration of thorax light gray, praescutum with narrow intermediate pale brown stripes; antennal flagellum black, segments incised; wings pale brownish gray, prearcular and costal fields yellowed, stigma light brown, veins brownish black; male hypopygium with tergal canthi small, tips obtuse; outer dististyle very broad, especially outwardly, diameter at apex nearly equal to the length; posterior margin of eighth sternite with long yellow setae.

MALE.— Length about 14.5 mm.; wing 14 mm.

Frontal prolongation of head stout, slightly exceeding the remainder; nasus virtually lacking, represented by a small tubercle that bears a few long setae; prolongation brown, gray pruinose above, polished beneath. Antennae with scape and pedicel light yellow, flagellum abruptly black, segments with basal enlargements well-developed to present an incised appearance. Front and anterior vertex yellow; posterior vertex more grayish yellow with indications of a capillary darker median line.

Prothorax light yellow, including the scutellum and dorsopleural membrane. Mesonotal praescutum light gray with intermediate pale brown stripes that are narrower than the broad ground interspaces, lateral stripes very pale; pseudosutural foveae reduced to small shallow pits; posterior sclerites gray, each scutal lobe with two pale brown areas, the anterior one very small; scutellum and medio-tergite with a poorly indicated darkened median line, parascutella more yellowed. Pleura gray. Halteres with stem yellow, knob brown. Legs with coxae gray; trochanters yellow; femora obscure yellow, tips darker; tibiae yellowish brown, darker outwardly, tarsi passing into black; claws of male with a strong tooth. Wings pale brownish gray, prearcular field, together with cells *C* and *Sc* yellow, stigma light brown, cell *Sc*₁ above it more yellowed; outer ends of radial cells and extensive clouds in both anal cells very slightly darker than the ground; obliterative area at cord whitened, inconspicuous; veins brownish black, much paler in the brightened costal field. Vein 1st *A* without trichia, 2nd *A* with these numerous and well distributed, extending basad almost to the arculus. Venation:

Petiole of cell M_1 shorter than the oblique m ; $m-cu$ shortly before fork of M_{3+4} .

Basal abdominal tergites light brownish gray, remaining tergites obscure yellow, the more proximal ones with indications of three brownish gray stripes, outer segments more uniformly yellow; sternites yellow, with abundant small erect dark setae. Male hypopygium with subtergal process of tergite elongate, the slender outer half pale and more membranous; canthi small, outer part narrow, apex obtuse. Outer dististyle distinctive, very broad, widened outwardly, apex nearly truncate; the diameter across apex nearly equal to the length of the style; inner style with dorsal crest strongly rounded, blackened; beak obtuse, lower beak very stout; outer basal lobe sub-oval, in size and outline not greatly different from the outer style. Eighth sternite with caudal margin fringed with very long yellow setae, none conspicuously enlarged. In the unique type the sternite is damaged but appears to have posterior lateral lobes that bear unusually long setae, with a further development of long setae between these groups.

HABITAT.—Utah.

HOLOTYPE, ♂, Dixie State Park, Washington County, April 24, 1968 (G. F. Knowlton and D. W. Davis).

The most similar species appears to be *Tipula (Eremotipula) mitrata* Dietz, of New Mexico, which is known to me only from the original description. From this the species appears to differ in coloration and structure of the antennae, coloration of the wings, and in details of hypopygial structure. The outer dististyle of the hypopygium in the present fly shows the maximum breadth of any species in the subgenus.

Gonomyia (Idiocera) persimplex. n.sp.

In general appearance most as in *coloradica* and *gothicana*, especially in the unpatterned wings; male hypopygium with all three dististyles simple.

MALE.—Length about 6 mm.; wing 5 mm.

Described from alcoholic material. Rostrum and palpi brown. Antennae black, proximal half of scape brownish yellow; flagellar segments oval, the outer ones more elongate. Head dark brown, anterior vertex, sides of vertical tubercle and the genae yellowish gray.

Pronotal scutum yellow, patterned with dark brown, scutellum yellowed. Mesonotal praescutum dark brown, lateral borders and an isolated area in humeral region light yellow; scutal lobes dark brown; scutellum brown, posterior border yellow; parascutella, pleurotergite and lateral borders of mediotergite light yellow. Pleura dark brown, dorsopleural region and a broad longitudinal stripe whitened. Halteres with stem pale, knob weakly darkened. Legs with coxae yellowed, fore pair slightly more infuscated; trochanters yellow; femora light brown, slightly darker near tips; remainder of legs brown. Wings subhyaline, unpatterned except for the small pale brown

stigma, prearcular and costal fields slightly more yellowed; veins pale brown. Longitudinal veins beyond cord with trichia except R_3 , also occurring on R_s , extreme outer end of basal section of Cu_1 and the distal third of $1st A$. Venation: Veins R_{1+2} and R_3 contiguous at margin; $m-cu$ more than its own length before fork of M .

Abdomen dark brown, pleural membrane yellowed. Male hypopygium with outer lobe of basistyle broadly obtuse, with abundant long setae. All three dististyles simple; outer style longest, appearing as a slender pale spine that narrows to the long terminal point; intermediate style blackened on outer part, similar in shape to the outer style but shorter; inner style very pale, widened basally, outer end slender, blackened. Aedeagus of unique type broken. The intermediate styles of the two sides are unequal, one being only about one-half the size of the other, this presumably representing an abnormal condition.

HABITAT.— Utah.

HOLOTYPE, alcoholic ♂. Fish Creek, Sevier County, June 21, 1967 (C. D. Hynes).

The most similar regional species include *Gonomyia (Idiocera) coloradica* Alexander and *G. (I.) gothicana* Alexander, both quite different in hypopygial structure, especially the dististyles, as described.

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